STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT

PERMIT TO OPERATE A SEPTAGE LAND APPLICATION SITE

David Brantley & Sons, Inc.
Ryan S. Brantley
37 Pine Ridge Road
Zebulon, NC 27597

is hereby issued a permit to operate a Septage Land Application Site with permit # **SLAS-35-06** on SR#1729 in Franklin County at approximate position 35.91939° N latitude and -78.27021° W longitude. The site is to be operated in accordance with 15A NCAC 13B .0800 Septage Management, the information stated in the approved application, and the conditions of this permit. The unauthorized disposal of any liquid or solid wastes other than those specified in the conditions of this permit will be considered a violation of the conditions of this permit. Failure to comply with the conditions of this permit may result in permit suspension, permit revocation, action for injunctive relief, administrative penalties, or other remedies as provided in G.S. 130A, Article 1., Part 2.

This permit shall be reviewed annually to determine if soil test results and management activities are in compliance with the Septage Management Rules and the conditions of this permit. Modifications, where necessary, shall be made in accordance with rules in effect at the time of review.

Date Issued 8/15/11

Michael E. Scott, Chief
Solid Waste Section

Permit Conditions:

1. This permit shall become void if the soils fail to adequately assimilate the septage and shall be rescinded unless the site is maintained and operated in a manner which will protect the assigned water quality standards of the surface waters and ground waters.

2. This site shall be operated and maintained in accordance with the nutrient management plan submitted by Ryan S. Brantley and approved by the Division. **This site shall be managed as one field of 6.2 acres.** Areas that drop below 80% coverage of fescue shall be reseeded at a rate of 15-20 lbs per acre. The fescue shall be cut and baled as hay whenever it reaches approximately 12 inches in height or roughly every 4 to 6 weeks beginning in the spring. Land application shall be rotated between this septage land application site and septage land application site #35-07 in regards to the 30-day waiting period between the land application of septage and the harvest of a crop. All discharges shall be at locations on the site consistent with the crop rotation in the approved plan.

3. This site shall be operated and maintained in accordance with the erosion and runoff control plan submitted by Ryan S. Brantley. Any site improvements noted in the plan must be installed within 30 days of plan approval. The site shall be operated and erosion and runoff control measures maintained in such a manner as to prevent migration of wastes off of the designated waste receiving site. The installation of groundwater monitoring wells may be required.

4. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction. It is the responsibility of the Permittee to be in compliance with the requirements of 40 CFR 503.

5. This permit may be modified or reissued to incorporate any conditions, limitations and monitoring requirements the Division of Waste Management deems necessary to adequately protect the environment and public health.

6. **This site is only permitted for the land application of domestic septage (including portable toilet waste) and grease trap pumpings. Commercial/industrial septage shall only be land applied after the waste from each source is tested and the results approved by the Solid Waste Section.** Domestic septage pH shall be raised to 12 or higher by alkali addition and, without the addition of additional alkali, shall remain at 12 or higher for 30 minutes prior to land application. Grease septage or grease septage mixed with domestic septage shall be raised to pH 12 or higher by alkali addition and, without the addition of additional alkali, shall remain at 12 or higher for 2 hours prior to land application. **Grease septage may be land applied without diluting 1:1 with domestic septage or water, if sufficiently processed through the SDTF facility (permit #35-07) and no crop damage occurs. Grease septage processed throught the SDTF facility (permit #35-07) shall be pH 12 when land applied.**

7. This site contains approximately 6.2acres that are available for the land application of septage. **Within that total disposal area 4.8 acres will be utilized by the irrigation system for dewatered effluent at the application rate of 198,000 gallons per acre per year for a maximum annual application rate of 950,400 gallons. The remaining 1.4 acres will be utilized by a pump truck for septage at an application rate of 50,000 gallons per acre per year for a maximum annual application rate of 70,000 gallons. This results in a total, maximum annual application rate for the entire site of 1,020,400 gallons.** This application rate assumes equal septage distribution, on an annual basis, over the permitted area. **Monthly septage applications shall not exceed the monthly relative application rates given in the approved nutrient management plan for the site. This application rate is based on the nutrient amounts in the waste analysis results that were submitted for this permit modification. The current numbers are 0.25 lbs of nitrogen, 0.53 lbs of potassium and 0.85 lbs of phosphorus per 1000 gallons.**

8. An approved above ground septage detention system with a minimum design capacity of 19,623 gallons shall be available prior to operation of this site unless an approved wastewater treatment plant is available for use during periods of adverse weather. The storage capacity may be adjusted if it is demonstrated during the operation of the site that this volume of storage is inappropriate.

9. Only the area designated on the attached site map(s) shall be utilized for septage disposal. Each load of septage discharged at the site shall be distributed from a moving vehicle in such a manner that there is no standing water when the discharge is complete. Septage shall not be applied during periods of high soil moisture.

10. This permit shall become voidable unless the land application activities are carried out in accordance with the conditions of this permit and in the manner approved by this Division. **No firm other than the Permittee (David Brantley & Sons, Inc.) shall discharge septage at this site without prior appropriate notification and written approval of the Division of Waste Management. The appropriate authorization form shall be submitted to the Division of Waste Management for any firm other than the Permittee. Domestic and grease septage from other permitted septage management firms may be land applied at this site as long as the monthly & annual application rates are not exceeded.**

11. Prior to any transfer of this land, a notice shall be given to the new owner that gives full details of the materials applied or incorporated at this site. The Division shall be notified prior to site closure.

12. **This permit shall expire on July 17, 2014.** Modifications, when necessary, shall be made in accordance with the rules in effect at the time of renewal. An application for permit renewal shall be submitted at least ninety (90) days prior to the permit renewal date. A septage application log for the period of time this permit was valid shall be submitted along with an application for permit renewal or modification. The information required in the log is described in Rule 15A NCAC 13B .0838(e)(1) of the NC Septage Management Rules and 40 CFR Part 503.17(b) of the Federal Register. **However, because of the higher application rate, these logs shall be submitted monthly to the Solid Waste Section. Also at least one complete NCDA Waste Analysis shall be run quarterly. Copies of the results shall be submitted quarterly to the Solid Waste Section.** This permit is non-transferable.

13. Records shall be kept in accordance with 40 CFR 503.17(b). These records shall be made available to a representative of the Division of Waste Management upon request.

14. Any duly authorized officer, employee, or representative of the Division of Waste Management may, upon presentation of credentials, enter and inspect any property, premises, or place on or related to the disposal site and facility at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be kept under the conditions of this permit; or may obtain samples of groundwater, surface water, or leachate.

15. Field separations in the nutrient management plan and all pertinent setbacks shall be clearly located on the site. **There shall be a 5 foot setback off the woodline, a 10 foot setback off the path bordering the west side of the site and also a swale area was excluded from the back west side of the site.**

16. The areas that can be used for land application of septage shall be maintained at least 500 feet from any existing wells, residences, places of business, or places of public assembly. Septage shall not be disposed of within 50 feet of any property line or any neighboring crop intended for human consumption or within 100 feet of any ditch.

17. **A leak or pressure test shall be performed and certified by a professional engineer for any below grade lines for the proposed irrigation system. This certification shall be submitted to this office and approval granted by the Division of Waste Management prior to utilizing the proposed irrigation system.**

18. **Land application events utilizing irrigation shall be adequately monitored to ensure proper operation of the system and even application of the waste.**

19. **Supplemental nutrient rates (combined with septage applications) shall not exceed the realistic yield expectations for the crops grown onsite.**

North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

August 15, 2011

Mr. Ryan S. Brantley
David Brantley & Sons, Inc.
37 Pine Ridge Road
Zebulon, NC 27597

RE: SLAS permit modification
David Brantley & Sons, Inc.
SLAS-35-06
SR#1729 in Franklin County

Dear Mr. Brantley:

The NC Division of Waste Management has reviewed your application for a septage land application site in Franklin County. Your application has been approved and your modified permit (**to increase the application rate**) #SLAS 35-06 is enclosed. If you have any questions about your permit, we'll need the number in order to answer your questions.

Please read all of your permit conditions carefully. Your nutrient management and soil erosion and runoff control plans have been included in your permit's conditions. Please note Permit Condition 7 which clarifies that **4.8 acres will be utilized at an application rate of 198,000 gallons and 1.4 acres will be utilized at an application rate of 50,000 gallons for a maximum annual application rate of 1,020,400 gallons. Please mark the disposal field and adjust your site logs accordingly.** Also note Permit Condition 12, which states that **you will need to submit site logs each month and a waste analysis report each quarter to the Solid Waste Section.** This permit condition also states that this permit is valid until July 17, 2014. If you have any questions, please ask for assistance as rule violations could expose you to administrative penalties.

Please note that to land apply industrial or commercial septage at a permitted septage disposal site you must have prior approval from the NC Division of Waste Management. The waste must be sampled prior to being removed from the system. Generally, the Division will request that you have a waste analysis run on septage from each commercial or industrial septage generator before that type of septage is approved for land application.

Use of a land application site or septage detention or treatment facility that is not permitted may result in administrative penalties up to $15,000 per violation in accordance with NC General Statute 130A-22.

If you have any questions please feel free to contact me at (910) 433-3352 or Michael Scott at (919) 508-8497.

Sincerely,

Connie Wylie, Soil Scientist
Composting & Land Application Branch

Enclosures

cc: files
Franklin County Health Department

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APPLICATION FOR PERMIT TO OPERATE A SEPTAGE LAND APPLICATION SITE

North Carolina Department of Environmental and Natural Resources
Division of Waste Management – Solid Waste Section
401 Oberlin Rd., Ste. 150, Raleigh, NC 27605

I. Site and Operator Information

1. Applicant: David Brantley & Sons, Inc.
   Address: 37 Pine Ridge Rd
   Zebulon, NC 27597
   Phone: 252-478-3721

2. Contact person for site operation (if different from applicant): Shane Brantley
   Title or position: President Phone: 919-669-5187
   Address: 272 Johnson Town Rd
   Zebulon, NC 27597

3. Landowner: Ryan Shane Brantley
   Address: 272 Johnston
   Zebulon, NC 27597

4. Site Location: County: Franklin State Road Number: NC Hwy 39
   Directions to site: Hwy 64 East to Hwy 39 North, go about 5 miles turn left on on Johnstontown Rd second drive on the left

5. Indicate whether request is: new ☐ renewal ☐ modification ☒ 198.
   Request to add to application field. lower field At [illegible],000 per Acre 3.75
   2.50 Acre At 50,000

   For a permit renewal or modification, provide the following information:
   Existing permit number: 35-06 Permit expiration date: ________

6. Number of acres meeting the requirements of the NC Septage Management Rules: [illegible] 6.25

7. Substances other than septage or grease trap pumping previously disposed of on this site:
   (a) None ☒ , or (b) Attach a list indicating other substances, the amounts discharged, and the dates of discharge.

8. Attach written, notarized landowner authorization to operate a septage disposal site signed by the landowner (if the permit applicant does not own the property). If a corporation owns the land use a corporate landowner authorization form. If Limited Liability Company owns the land, use a limited liability company landowner authorization form.

9. Attach site evaluation report, including aerial photograph and soil analysis with metals results, unless the Division prepared the report.

10. Attach a vicinity map (county road map showing site location).

II. Site Management Information:

The following information shall be included with the application form:

1. Nutrient Management Plan
2. Soil Erosion and Runoff Control Plan

3. Alternative plan for disposal (detention facility permit number or wastewater treatment plant authorization SDTF-35-07 SLAS 35-06

4. Types of septage proposed to be discharged at the site (check all that apply):
   a) Domestic septage pumped from septic tanks ☒
   b) Grease trap pumpings ☒
   c) Portable toilet waste ☒
   d) Commercial/Industrial septage ☒

5. Proposed treatment method of each type of septage to be land applied (use additional paper to explain if necessary): Lime stabilization, septage a pH of 12 or greater for 30 minutes, Grease a pH of 12 or greater for 2 hours All septage land applied at pH of 12

6. Proposed method of applying septage to land, including septage distribution plan if required * (use additional paper to explain if necessary): Spray by truck evenly across the site or a traveling gun irrigation system

7. Demonstration from the appropriate state or federal government agency that the land application site complies with the Endangered Species Law ** or if any part of the site specified is not agricultural land (use additional paper to explain if necessary): Agriculture land

III. Certification

I hereby certify that:

1. The information provided on this application is true, complete, and correct to the best of my knowledge.
2. I have read and understand the NC Septage Management Rules, and
3. I am aware of the potential consequences, including penalties and permit revocation, for failing to follow all applicable rules and the conditions of a Septage Land Application Site Permit.

Ryan D Brantley — Signature***

6-14-11 — Date

Ryan Brantley — Print name

Pres — Title

Note: This application will not be reviewed until all parts of the application are complete.
*Refer to section .0821 (e) of the NC Septage Management Rules
**Refer to section .0821 (g) of the NC Septage Management Rules
***Signature of the Company Official required

RECEIVED
JUN 22 2011
DENR -FAYETTEVILLE REGIONAL OFFICE

SHAFFER SOIL SERVICES, INC.

685 SANFORD ROAD
PITTSBORO, N.C. 27312
919-542-5803

July 5, 2011

Mr. Shane Brantley
Brantley and Sons Septic Tank Service
37 Pine Ridge Road
Zebulon, NC 27595

Subject: Nutrient Management Plan Amendments
SLAS-35-06 and SLAS 35-07
Franklin County, NC

Shane:
Subsequent to my completion of the nutrient management plan for your septage sites, and the amendments dated June 21, 2011, I received a notice from Chester Cobb, L.S.S. with the NC Composting and Land Application Branch of the Division of Waste Management. He has requested some minor edits to the nutrient management plan. Below I will outline each concern that was noted and how it is to be addressed.

1) Mr. Cobb has asked for nitrogen mineralization calculations to justify the N numbers used in the plan. This will follow on a separate attached sheet.
2) Mr. Cobb requires lowering the annual total to less than 200,000 gallons per acre per year. They have allowed up to 198,000 gallons per acre per year and will do so for your situation as well. The plan is changed to reflect a maximum of 198,000 gallons per acre per year.
3) Mr. Cobb suggests making one rate in the summer months, not tied to moisture. The summer month rates are revised.
4) Mr. Cobb suggests using only a **maximum** rate on the rate table, instead of giving ranges for the low, medium, and high categories. The rate tables have been revised.
5) On the smaller, 6.25 acre field, you will need to set markers for where the truck application will start. These markers need to be 120 feet west of the point where the traveling gun runs. These markers do not represent the wetted edge, but rather a point about 20 feet into the wetted area which will not receive much irrigation water due to the gun pattern. Since you are overlapping somewhat, for the truck run that applies on the overlap area, you should drive 1.5 to 2 times as fast as the speed for which you spread over the rest of the field.

The following pages complete the requested changes. In some cases, you will remove current pages from the June 21 plan and insert these new pages. Mr. Cobb has been given a copy of this information too. You will need to supply him with a signed copy of the plan once you insert these amended pages. Please let me know if you have any questions concerning this information.

Sincerely,

Karl Shaffer, L.S.S.
Technical Specialist- Nutrient Management, Wettable Acres

Attachments: Nitrogen Calculation Page
Amendment Pages 4, 5, 7, 14 (Replace the June 21, 2011 pages with these edited pages)

Cc: Chester Cobb, L.S.S. Division of Waste Management

BRANTLEY & SONS SEPTIC TANK SERVICE
FRANKLIN COUNTY, NC
NITROGEN CALCULATIONS

The plant available N from the average of the septage samples is 0.25 pounds N per thousand gallons for year 1. This is based on the assumed 40% nitrogen mineralization rate. Subsequent years will generate 50% of the previous year plant available N, which means the subsequent year's rates are 20%, 10%, 5%, and 2.5% (rounded to 3%) respectively. The data will be shown in Table format. It is assumed that 198,000 gallons per acre per year will be applied.

Year	Application Rate	N applied	Carryover from previous yr	Carryover from previous yr	Carryover from previous yr	Carryover from previous yr	Carryover from previous yr	Total N (lbs) available *
1	198,000 gal/acre	49.5 lbs						49.5
2	198,000 gal/acre	49.5 lbs	24.8 lbs					74.3
3	198,000 gal/acre	49.5 lbs	24.8 lbs	12.4 lbs				86.7
4	198,000 gal/acre	49.5 lbs	24.8 lbs	12.4 lbs	6.2 lbs			92.9
5	198,000 gal/acre	49.5 lbs	24.8 lbs	12.4 lbs	6.2 lbs	3.1 lbs		96
6	198,000 gal/acre	49.5 lbs	24.8 lbs	12.4 lbs	6.2 lbs	3.1 lbs	1.6 lbs	97.6

* From septage

Note that with continued application at the above defined rates, the N rate will not be exceeded for either field. The N rates are 151 pounds per acre (113 if grazed), and 129 pounds per acre (97 if grazed).

SHAFFER SOIL SERVICES, INC.

685 SANFORD ROAD
PITTSBORO, N.C. 27312
919-542-5803

June 21, 2011

Mr. Shane Brantley
Brantley and Sons Septic Tank Service
37 Pine Ridge Road
Zebulon, NC 27595

Subject: Nutrient Management Plan Amendments
SLAS-35-06 and SLAS 35-07
Franklin County, NC

Shane:
Subsequent to my completion of the nutrient management plan for your septage sites, I received a notice from Chester Cobb, L.S.S. with the NC Composting and Land Application Branch of the Division of Waste Management. He has requested further information to complete the nutrient management plan. Below I will outline each concern that was noted and how it is to be addressed. Below these explanations is the revised plan accounting for all factors.

1) Originally I used a 30% mineralization rate as that is the estimate that was used by the laboratory. Mr. Cobb suggested starting with a 40% mineralization rate which is a more conservative approach. This approach will ultimately give a larger PAN figure resulting in fewer gallons per acre applied. In both cases, the use of a 50% PAN reduction each year was applied. I will use the default rates suggested by Mr. Cobb to be consistent with their program. The calculations for PAN are shown in the revised nutrient management plan attached below.
2) Mr. Cobb suggests lowering monthly application rates. These rates will be lowered due to the revised PAN calculations as explained above. Mr. Cobb also states that a maximum of 200,000 gallons per acre per year is the maximum that will be permitted without a detailed site hydraulic assessment. [(Rule notation .0835 (c).11) : *Applicants proposing to land apply 200,000 gallons per acre per year or more shall provide a plan for monitoring soil moisture levels and the depth to seasonal wetness to determine when land application can occur without impacting ground water or hydraulic overloading. The plan shall include recommendations concerning annual and instantaneous loading rates of liquids, solids, other wastewater constituents and amendments based on in-situ measurement of saturated hydraulic conductivity in the most restrictive horizon. If required by G.S. 89C, G.S. 89F and G.S. 89E, a professional engineer, licensed soil scientist or licensed geologist shall prepare these documents. [Note: The North Carolina Board of Examiners for Engineers and Surveyors, Board of Licensing of Soil Scientists and the Board of Licensing of Geologists has determined, via letters dated March 11, 2010, November 16, 2009 and January 7, 2010, that preparation of documents pursuant to this Paragraph constitutes practicing engineering, soil science or geology, under G.S. 89C, G.S. 89F and G.S. 89E.*] The septage, at this rate, will not meet the N needs of the crops. I will adjust the seasonal application as per Mr. Cobb's schedule unless you advise that you would like to entertain the site hydraulic assessment.
3) Item H of the plan will be deleted as suggested.

4) You have spoken with Michael Scott of the Composting and Land Application Branch and concluded that additional sampling was needed. Those samples have been taken and the data reflected in the revised plan below. The new sample data is attached at the end of this report.
5) A section of Soil Erosion and Runoff Control is now included.
6) Currently the irrigation system is operated such that wetted overlap does not occur. You stated that you wish to operate the larger (11.5 acre) field in a solid set irrigation mode, and the smaller 6.2 acre field with the east side being wetted by one irrigation pull, and the west side wetted with the truck. Also, your tank cleanouts, when needed, will go to the west side of the field by truck application. Maps have been prepared showing both fields, with 2 possible irrigation layouts on the large field.

Additional information:
For occasional tank sludge cleanouts that are to be applied to Field SLAS-35-06, the standard septage N concentration of 2.6 pounds of PAN per thousand gallons shall be used for calculations. This decision was based on discussion of this issue with Chester Cobb. The application rate must be dictated by the plant available N (PAN). See the attached plan for N application limits per field.

Please let me know if you have any questions concerning this information.

Sincerely,

Karl Shaffer, L.S.S.
Technical Specialist- Nutrient Management, Wettable Acres

Attachments: Nutrient Management Plan with attachments
Soil Erosion Control Plan
Irrigation Plan(s)
Supporting Information

Cc: Chester Cobb, L.S.S. Division of Waste Management

BRANTLEY AND SONS SEPTIC TANK SERVICE, INC.

NUTRIENT MANAGEMENT PLAN FOR TREATED SEPTAGE APPLICATIONS TO TALL FESCUE

SLAS-35-07

SLAS-35-06

June 21, 2011

Introduction:

This nutrient management plan serves as an amendment to previous plans written for this company and its septage application fields. Brantley and Sons dewaters septage, composts the solids, and irrigates the liquid effluent through an irrigation traveling gun system. As requested by the Solid Waste Section of DENR, waste samples have been collected and analyzed for nutrient content. A copy of this lab report is attached as an appendix. Four samples were taken. The samples show a very consistent and homogenous liquid material with the following characteristics:

- pH averages 11.3 and ranges from 11.15 to 11.57
- Plant available N for irrigation averages 0.25 pounds per 1,000 gallons and ranges from 0.18 to 0.49
- Plant available P averages 0.53 pounds per 1,000 gallons and ranges from 0.33 to 1.1
- Plant available K averages 0.85 pounds per 1,000 gallons and ranges from 0.32 to 3.30
- Plant available metals all show as a trace (below effective agronomic level)

This data will be used as the basis for the nutrient plan and related calculations below. The waste analysis report does not specify the forms of nitrogen. It is safe to say that it is largely in the organic and ammonia forms. A 40% organic N mineralization rate is presumed, with subsequent years being 20, 10, 5, and 3% respectively. Since it is assumed that septage will be applied yearly to this site, carryover N must be accounted for. The "decay" rate is about 50% available each subsequent year after year 1. When this rate is carried out to 5-6 years, the effective rate of N mineralization is less than 2% and not significant. When combining all post-year mineralization rates along with new application rates, one finds that one must effectively reduce the full target rate by 50%. This reduced rate will be shown below for each field.

Irrigation is through a traveling gun reel. If this system is not able to reach the entire permitted section of the field, septage may be applied through a smaller irrigation system to the perimeter areas or it may be applied through tanker vehicle. The plan below will be based on a per-acre basis. The owner/operator is responsible for insuring that septage is uniformly spread by all types of application methods. If irrigation is used solely, then the effectively irrigated area should be determined and used as the area for application calculations.

Soil test data for both fields was reviewed. The soil test is dated 12/28/2010 (report numbers 19484 and 19483). The soil pH is in a good range and standard nutrient recommendations occur, except note that sulfur is recommended for sample 1 at a rate of 15-20 pounds per acre. Otherwise there are no micronutrient deficiencies, and no constituents such as phosphorus, copper, zinc, or sodium show any level of concern. The exchangeable sodium percentage is 1.2 to 2.3, which is well below the action level of 15. A moderate amount of potash is recommended, which may be made up by the septage. This calculation will be shown below.

A. General Information:

1. Field SLAS-35-07 is permitted and contains 11.5 acres as per the permit. Septage is to be irrigated. Current DWM-Septage and Compost Branch maps and permits show the approved area and all buffers. Two additional maps are included in this nutrient management plan update showing two possible irrigation scenarios. The dominant soil series is Varina loamy sand, 2- 6 percent slopes. Irrigation plan 1 is approximately 80% effective in reaching all field areas. Another 15-17% can be reached by truck application. Irrigation plan 2 is approximately 85% effective in reaching all field areas. Another 12-13% can be reached by truck application.

   Field SLAS-35-06 is permitted and contains 6.25 acres as per the permit. Septage is to be irrigated with a single travel pull down the east side, with truck application down the west side (see attached map). Current DWM-Septage and Compost Branch maps and permits show the approved area and all buffers. No additional maps are included in this nutrient management plan update. The dominant soil series is Wedowee sandy loam, 2- 6 percent slopes.

2. The crop to be grown on both fields is fescue for hay, with no grazing.

3. The limiting nutrient designed for the site is nitrogen.

   The RYE for field SLAS-35-07 is 3.43 tons/acre for fescue hay with an N factor of 44 pounds per ton of yield, equaling an N rate of 151 pounds N/acre. At the liquid septage concentration from the laboratory analyses of 0.25 pounds N/1000 gallons, this equates to a septage application rate of 604,000 gallons per acre per year. This rate equates to a hydraulic load of 22.2 inches of wastewater application per year. These soils are well capable of handling these rates over a year's time. HOWEVER, a maximum of 198,000 gallons per acre per year is the limit which can be applied unless the hydraulic study referred to in the rules is completed. This equates to 7.4 inches of wastewater application per year. I recommend that any individual application event not exceed 0.70 inch of wastewater. The traveling reel parameters should be set to not exceed this rate. For the current settings, this equates to a travel speed of 22 inches per minute. In a solid set operational mode, it equates to an irrigation run time at each location of 156 minutes for Irrigation Plan 1, or 208 minutes with Irrigation Plan 2. With the waste analysis phosphorus of 0.53 pounds per thousand gallons, the crop's phosphorus needs are met with septage. With the waste analysis potassium of 0.85 pounds per thousand gallons, the crops potassium needs are met with the septage.

   Counting for mineralization of organic N in subsequent years would allow an annual hydraulic loading in years 5 and beyond of well above the annual hydraulic limit of

KAS

198,000 gallons per acre per year. Hence, the following application rate schedule occurs for field SLAS-35-07:

YEAR	APPLICATION RATE (GALLONS PER ACRE PER YEAR)
1	198,000
2	198,000
3	198,000
4	198,000
5	198,000
6 and beyond	198,000

The RYE for field SLAS-35-06 is 2.93 tons/acre for fescue hay with an N factor of 44 pounds per ton of yield, equaling an N rate of 129 pounds N/acre. At the liquid septage concentration from the laboratory analyses of 0.25 pounds N/1000 gallons, this equates to a septage application rate of 516,000 gallons per acre per year. This rate equates to a hydraulic load of 19 inches of wastewater application per year. These soils are well capable of handling these rates over a year's time. I recommend that an individual application event not exceed 0.7 inch of wastewater. With the waste analysis phosphorus of 0.53 pounds per thousand gallons, the crop's phosphorus needs are met with septage. With the waste analysis potassium of 0.85 pounds per thousand gallons, the crops potassium needs are met with the septage.

Counting for mineralization of organic N in subsequent years would allow an annual hydraulic loading in years 5 and beyond of well above the annual hydraulic limit of 198,000 gallons per acre per year. Hence, the following application rate schedule occurs for field SLAS-35-06:

YEAR	APPLICATION RATE (GALLONS PER ACRE PER YEAR)
1	198,000
2	198,000
3	198,000
4	198,000
5	198,000
6 and beyond	198,000

The calendar year for fescue starts July 1 and ends June 30. *Note that an application rate of 50,000 gallons per acre per year can only be exceeded with prior approval from the Solid Waste Division and with management from a certified land application operator.*

4. Septage will not be applied where the site is untrafficable (untrafficable is defined as soil that will allow a loaded truck to leave a depression in sod greater than 3 inches in depth). As these soils are well drained with good surface and internal drainage, that should only occur after heavy or prolonged periods of rain or snow. When using irrigation systems, untrafficable also applies to the gun cart and the reel, if moved. Further, septage may only be applied when the ground is in a condition that will allow for adequate infiltration, with no ponding or runoff. This rate will vary over the year as weather conditions and crop transpiration rates change.

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5. All nitrogen recommendations for forages will be 75% of the realistic yield expectation nitrogen rate should the forage be grazed.

6. Septage storage shall be provided to account for the average volume of septage pumped per week, or an alternative plan, such as disposal at a waste treatment plant, should be in place. In this case of irrigation systems, storage in excess of 1 week is strongly encouraged. 30 days or more of storage offers better operational flexibility for situations where incoming septage is greater than the ability to apply to the fields during wet periods.

B. Crops to be grown and approximate planting times:

1. The sites presently are in fescue hay and do not require replanting. Bare areas, should they occur, can be seeded (broadcast or drilled) at a rate of 15-20 lbs seed/acre in September to early October or late February to early April in order to enhance the stand. The recommended fertilizer and lime as per the NCDA&CS soil test should be applied prior to re-seeding, except that nutrients and lime that may be applied prior to overseeding should be accounted for. After overseeding, traffic should be minimized on the site to increase seedling vigor. This may include restricting access to hunters who may damage and rut the site with their vehicles. If hunters use the area, establish a path for them in the field border where septage is not applied. If a broadcast seeding method is used, very light tillage and/or cultipacking is necessary to establish good seed-soil contact. For very small areas the seed should not be tilled, but depending on moisture status, a light rolling may be needed. Further advice may be sought through the Cooperative Extension Service or NCDA&CS regional agronomist.

C. Limiting Nutrient application rate for crops grown:

1) Cleared Field - RYE = Realistic Yield Expectations
Field SLAS-35-07

Crop	RYE		Limiting Nutrient App. Rate		lbs N/acre
Tall fescue hay	3.43 tons/acre	x	44 lbs N/dry ton	=	151

Reduction if grazed: 0.75 x 151
= 113

Field SLAS-35-06

Crop	RYE		Limiting Nutrient App. Rate		lbs N/acre
Tall fescue hay	2.93 tons/acre	x	44 lbs N/dry ton	=	129

Reduction if grazed: 0.75 x 129
= 97

D. Relative application rates for both fields:

Month	Rate
January	Low
February	Medium
March	High
April	High
May	High
June	Medium
July	Medium
August	Medium
September	Medium
October	Medium
November	Medium
December	Low

Description of terms: None = 0 gallons; Low = maximum of 20,000 gallons; Medium = maximum of 30,000 gallons; High = maximum of 40,000 gallons. These are maximum application amounts, per acre per month. ***Cumulative yearly application rate is not to exceed the permitted application rate.***

E. Application Method

The preceding information is based on septage being evenly applied over the entire permitted site by irrigated septage application. Should there be an interest in injecting or incorporating the septage, the application rates will be lowered and must be adjusted. Septage injection must be performed with special equipment so as to not injure the crop stand. Discuss this option with the Solid Waste Management staff prior to investing in injection equipment.

F. Additional Fertility Requirements (not including the limiting nutrient from the waste stream)

Nitrogen, phosphorus and / or potassium will be added in accordance with the soil test results for the crops grown in order to achieve realistic yield expectations based on the soil at the land application site and nutrient loading rates. The calculations above show that with the current waste concentrations, no additional soil amendments of N, P and K are required. Sulfur amendments are recommended for 1 field. Soil pH shall be amended if recommended in the soil test report. PLEASE NOTE THAT LIME-AMENDED SEPTAGE WILL RAISE SOIL pH. YOU SHOULD CLOSELY MONITOR SOIL pH AND ALSO HAVE THE SEPTAGE CHECKED FOR ITS LIME VALUE TO INSURE THAT THE SOIL pH DOES NOT BECOME TOO HIGH. THE COST OF SEPTAGE ANALYSIS FOR LIME VALUE IS CURRENTLY $10.00 WITH THE NCDA&CS LABORATORY.

KBS

The buffer areas may be fertilized with approximately 120 lbs/acre/year of N, 40 lbs/acre/year of P_2O_5 , and 80 lbs/acre/year of K_2O or based on soil test results (sample buffer areas separately for future soil testing).

G. Harvest of the crops and their use:

1. The fescue will be cut as hay and baled whenever it reaches approximately 12 inches in height or just before seedhead emergence. This will usually take place in late May and late June, weather dependent, and again in September or October. At least three fescue harvests will be made each year depending on environmental conditions. The permit may specify further hay harvesting requirements and restrictions.

2. A 30-day waiting period must be observed between the last application of septage and harvest.

3. The hay will be sold to a local farmer to feed his beef cows and horses.

This nutrient management plan is based upon the data supplied to Shaffer Soil Services, Inc. by Brantley and Sons, Inc. The plan is based upon the soil and waste analyses represented herein. The dates of these reports is current and the reports are assumed to represent both the soils and waste product that are intended for land application. Proper sampling and labeling of the soil and waste samples is the responsibility of the permittee. Soil and waste chemistry may change over time, and this may require updating of the nutrient plan and/or septage application permit should either occur.

Submitted by: Shane Brantley Date: June 21, 2011

Site Operator

Signed: Ryan D Brantley

Plan prepared by: Karl Shaffer, L.S.S., Certified Technical Specialist - Nutrient management Planner Date: _____

Address: 685 Sanford Road

Pittsboro, NC 27312

Phone: (919) 542-5803, (919) 244-1984

Signed: Karl Shaffer

Realistic Yield Expectations for North Carolina Soils

The following tables are the result of extensive data gathering and review process conducted by NC State University, the Natural Resource Conservation Service, the North Carolina Department of Agriculture and ConsurmerServices, and the North Carolina Division of Soil and Water Conservation. In 1999, county-based representatives of each of the above-named organizations were asked to collect yield data and make a reasoned judgement of the yields for various crops on each of the soils occurring in their county. These data were collected from 87 responses, representing 93 counties. The data were then compared with available research data and intensively reviewed by a panel of field agronomists, soil scientists and researchers familiar with the soils, crops and climatic conditions in each region. In reviewing the data, the following assumptions were made:

1. Realistic Yield Expectations should be based on the average of the best 3 years in a 5 year period which could be achieved with a high level of management (top 20% of growers)
2. For soils that may be mapped in multiple regions or in slightly different landscapes (for example, flood plains or stream terraces), the Realistic Yields are based on the most common prevailing conditions for that soil rather than the most ideal site for agricultural production.
3. For soils that are Somewhat Poorly, Poorly, or Very Poorly Drained, effective artificial drainage MUST be in place to achieve the yields shown in the RYE tables.
4. For tobacco production in the Piedmont physiographic, irrigation was assumed to be available, whereas no irrigation was assumed in the Coastal Plain physiographic region. This is in accordance with numerous surveys which show less than 15%-20% of tobacco in the Coastal Plain is irrigated, while 70 to 80% of tobacco in the Piedmont receives some irrigation

Citation: North Carolina Nutrient Management Workgroup. 2003. Realistic yields and nitrogen application factors for North Carolina crops. http://nutrients.soil.ncsu.edu/yields/ North Carolina State University, North Carolina Department of Agriculture and Consumer Services, North Carolina Department of Environment and Natural Resources, Natural Resources Conservation Service. Raleigh NC.

To access the database, select a county and at least one crop. Multiple crops may be selected by holding the Ctrl key when selecting crops. A report will be generated showing a summary of currently available data for the county you selected.

Select Your County: Franklin

Select Your Soil:
VaB: Vance sandy loam, 2 to 6 percent slopes
VaC: Vance sandy loam, 6 to 10 percent slopes
VgB: Varina gravelly sandy loam, 2 to 6 percent slopes
VnB: Varina loamy sand, 2 to 6 percent slopes

Correct for Slope:
(•) Use Representative Slope Typical of the Soil Mapunit
( ) Use my slope 0

Submit Reset

Realistic Yields for VnB: *Varina loamy sand, 2 to 6 percent slopes* in Franklin County

Crop	Yield	Nitrogen	Realistic	Estimated

		Factor	Nitrogen Rate (lbs/acre)	Phosphorus Removal (lbs P_2O_5/acre)
Barley (Grain)	67 Bushels	1.49	99	25
Corn (Grain)	98 Bushels	1.11	109	43
Corn (Silage)	0 Tons	10.9	0	0
Cotton	760 Pounds	0.081	62	22
Sorghum (Silage)	0 Tons	7.6	0	0
Oats (Grain)	83 Bushels	1.13	94	21
Peanuts	2156 Pounds	0	0	12
Rye (Grain)	49 Bushels	2.01	98	16
Small Grain (Silage)	8.3 Tons	11.1	92	45
Sorghum (Grain)	44 CWT	1.72	76	33
Soybeans (Double Cropped)	31 Bushels	0	0	25
Soybeans (Full Season)	37 Bushels	0	0	30
Soybeans (Double Cropped - Manured)	31 Bushels	3.89	122	25
Soybeans (Full Season - Manured)	37 Bushels	3.89	145	30
Tobacco (Burley)	0 Pounds	0.06	0	0
Tobacco (Flue Cured)	2352 Pounds	0.029	68	12
Triticale (Grain)	69 Bushels	1.52	104	23
Tropical Corn (Silage)	0 Tons	6.5	0	0
Wheat (Grain)	49 Bushels	2.01	98	25
Bahiagrass (Hay)	4.4 Tons	44	194	50
Caucasion/Old World Bluestem (Hay)	4.7 Tons	44	205	55
Common Bermudagrass (Hay)	4.4 Tons	44	194	53
Dallisgrass (Hay)	4.4 Tons	44	194	58
Fescue (Hay)	3.4 Tons	44	151	54
Hybrid Bermudagrass (Hay)	5.9 Tons	44	259	72
Hybrid Bermudagrass overseeded with Rescuegrass (Hay)	7.4 Tons	44	323	100
Mixed Cool Season Grass (Hay)	2.5 Tons	44	108	35
Orchardgrass (Hay)	2.5 Tons	44	108	36

Pearl Millet (Hay)	4.9 Tons	49	240	65
Rescuegrass (Hay)	3.4 Tons	44	151	39
Sorghum Sudan (Hay)	5.6 Tons	49	276	78
Timothy Grass (Hay)	0 Tons	44	0	0

Realistic Yield Expectations for North Carolina Soils

The following tables are the result of extensive data gathering and review process conducted by NC State University, the Natural Resource Conservation Service, the North Carolina Department of Agriculture and ConsurmerServices, and the North Carolina Division of Soil and Water Conservation. In 1999, county-based representatives of each of the above-named organizations were asked to collect yield data and make a reasoned judgement of the yields for various crops on each of the soils occurring in their county. These data were collected from 87 responses, representing 93 counties. The data were then compared with available research data and intensively reviewed by a panel of field agronomists, soil scientists and researchers familiar with the soils, crops and climatic conditions in each region. In reviewing the data, the following assumptions were made:

1. Realistic Yield Expectations should be based on the average of the best 3 years in a 5 year period which could be achieved with a high level of management (top 20% of growers)
2. For soils that may be mapped in multiple regions or in slightly different landscapes (for example, flood plains or stream terraces), the Realistic Yields are based on the most common prevailing conditions for that soil rather than the most ideal site for agricultural production.
3. For soils that are Somewhat Poorly, Poorly, or Very Poorly Drained, effective artificial drainage MUST be in place to achieve the yields shown in the RYE tables.
4. For tobacco production in the Piedmont physiographic, irrigation was assumed to be available, whereas no irrigation was assumed in the Coastal Plain physiographic region. This is in accordance with numerous surveys which show less than 15%-20% of tobacco in the Coastal Plain is irrigated, while 70 to 80% of tobacco in the Piedmont receives some irrigation

Citation: North Carolina Nutrient Management Workgroup. 2003. Realistic yields and nitrogen application factors for North Carolina crops. http://nutrients.soil.ncsu.edu/yields/ North Carolina State University, North Carolina Department of Agriculture and Consumer Services, North Carolina Department of Environment and Natural Resources, Natural Resources Conservation Service. Raleigh NC.

To access the database, select a county and at least one crop. Multiple crops may be selected by holding the Ctrl key when selecting crops. A report will be generated showing a summary of currently available data for the county you selected.

Select Your County: Franklin

Select Your Soil:
WaE: Wake-S
WbD: Wake-Wateree-Wedowee complex, 8 to 15 percent slopes, rocky
WcE: Wake-Wateree complex, 15 to 30 percent slopes, very rocky
WdE: Wateree-Rion-Wedowee complex, 15 to 30 percent slopes
WeB: Wedowee sandy loam, 2 to 6 percent slopes

Correct for Slope:
◉ Use Representative Slope Typical of the Soil Mapunit
○ Use my slope 0

Submit Reset

Realistic Yields for WeB: *Wedowee sandy loam, 2 to 6 percent slopes* in Franklin County

Crop	Yield	Nitrogen	Realistic	Estimated

		Factor	Nitrogen Rate (lbs/acre)	Phosphorus Removal (lbs P_2O_5/acre)
Barley (Grain)	67 Bushels	1.49	99	25
Corn (Grain)	108 Bushels	1.11	120	47
Corn (Silage)	19.6 Tons	10.9	214	67
Cotton	637 Pounds	0.081	52	18
Sorghum (Silage)	16.7 Tons	7.6	127	50
Oats (Grain)	83 Bushels	1.13	94	21
Peanuts	0 Pounds	0	0	0
Rye (Grain)	49 Bushels	2.01	98	16
Small Grain (Silage)	8.8 Tons	11.1	98	48
Sorghum (Grain)	49 CWT	1.72	84	37
Soybeans (Double Cropped)	33 Bushels	0	0	27
Soybeans (Full Season)	39 Bushels	0	0	31
Soybeans (Double Cropped - Manured)	33 Bushels	3.89	130	27
Soybeans (Full Season - Manured)	39 Bushels	3.89	152	31
Tobacco (Burley)	0 Pounds	0.074	0	0
Tobacco (Flue Cured)	2548 Pounds	0.029	74	13
Triticale (Grain)	69 Bushels	1.52	104	23
Tropical Corn (Silage)	19.6 Tons	6.5	127	67
Wheat (Grain)	49 Bushels	2.01	98	25
Bahiagrass (Hay)	3.7 Tons	44	162	42
Caucasion/Old World Bluestem (Hay)	3.9 Tons	44	172	47
Common Bermudagrass (Hay)	3.7 Tons	44	162	44
Dallisgrass (Hay)	3.7 Tons	44	162	48
Fescue (Hay)	2.9 Tons	44	129	46
Hybrid Bermudagrass (Hay)	4.9 Tons	44	216	60
Hybrid Bermudagrass overseeded with Rescuegrass (Hay)	0 Tons	44	0	0
Mixed Cool Season Grass (Hay)	2 Tons	44	86	28
Orchardgrass (Hay)	2.5 Tons	44	108	36

Pearl Millet (Hay)	4.2 Tons	49	204	55
Rescuegrass (Hay)	0 Tons	44	0	0
Sorghum Sudan (Hay)	4.7 Tons	49	228	65
Timothy Grass (Hay)	0 Tons	44	0	0

BRANTLEY AND SONS SEPTIC TANK SERVICE, INC.

NUTRIENT MANAGEMENT PLAN FOR TREATED

SEPTAGE APPLICATIONS TO TALL FESCUE

TANK CLEANOUTS USING PUMPER TRUCK

SLAS-35-06

June 22, 2011

This section is an amendment to the plan dated June 21, 2011. It only shows the details needed for the section of Field SLAS-35-06 for which a pumper truck will be used. The default N concentration of 2.6 pounds PAN per thousand gallons will be used as per discussion with Chester Cobb of the Division of Waste Management (June 22, 2011).

The RYE for field SLAS-35-06 is 2.93 tons/acre for fescue hay with an N factor of 44 pounds per ton of yield, equaling an N rate of 129 pounds N/acre. At the standard septage concentration of 2.6 pounds N/1000 gallons, this equates to a septage application rate of 49,615 gallons per acre per year. With the standard phosphorus and potassium concentrations of septage, the crop's phosphorus and potassium needs are met with the septage.

The calendar year for fescue starts July 1 and ends June 30. *Note that an application rate of 50,000 gallons per acre per year can only be exceeded with prior approval from the Solid Waste Division and with management from a certified land application operator.*

Limiting Nutrient application rate for crops grown:

Field SLAS-35-06

Crop	RYE		Limiting Nutrient App. Rate		lbs N/acre
Tall fescue hay	2.93 tons/acre	x	44 lbs N/dry ton	=	129

Reduction if grazed: 0.75 x 129
= 97

D. Relative application rates for SLAS 35-06 for truck application:

Month	Rate
January	Low
February	Medium
March	High
April	High
May	High
June	Medium
July	Low
August	Low

September	Medium
October	Medium
November	Medium
December	Low

Description of terms: None = 0 gallons; Low = maximum of 5,000 gallons; Medium = maximum of 10,000 gallons; High = maximum of 15,000 gallons. These are maximum application amounts, per acre per month. ***Cumulative yearly application rate is not to exceed the permitted application rate.***

KAS

BRANTLEY AND SONS SEPTIC TANK SERVICE, INC.

SOIL EROSION AND RUNOFF CONTROL PLAN

SLAS-35-07

SLAS-35-06

June 21, 2011

These 2 sites are to be managed in permanent fescue grass. The maximum slope on the fields is 8 percent. All natural drainageways are buffered out and serve as field strips. The current sod cover is adequate to maintain the soil/sod mix. Surrounding the field, the required 5-foot grassed buffer will be maintained. Further, the closest intermittent surface water is over 100 feet into the woods. No other soil erosion and runoff control measures are needed, other than operational measures discussed below. There are no additional cropping practices that can offer better erosion control than permanent sod.

Despite the fact that sufficient erosion control should be experienced with permanent fescue cover, the operator/site manager is strongly encouraged to use judgment in deciding when and where to apply septage. The steeper slopes should be saved for the driest periods. If there is any chance of forthcoming rain within 24-48 hours, the manager should use the slopes less than 6 percent. The quality of the fescue stand should dictate when and how much septage is applied. Lighter applications are warranted when the nutrient management plan calls for low applications or when the threat of septage runoff off the site is higher. The operator should calibrate and test the spreading equipment such that they are familiar with speeds and settings to apply appropriate application rates. Regular review of the fescue stand quality is critical to maintain forage health and adequate erosion control. At the first sign of plant stress, both soil tests and plant tissue analyses are encouraged to provide for sound management decisions. The fescue should be fertilized with septage and/or commercial fertilizer to maintain a good sod base across the application area and in buffer areas.

BRANTLEY AND SONS SEPTIC TANK SERVICE, INC.

IRRIGATION OPERATING PLAN

SLAS-35-07

SLAS-35-06

June 21, 2011

GENERAL IRRIGATION OPERATING PARAMETERS

Presently the irrigation gun is operated at 68 psi. A drawdown test has been performed by the operators and averages 200 gallons per minute. The irrigation gun specifications show that at 70 psi (close to operating pressure) the gun delivers 197 gallons per minute over a diameter of 310 feet. The gun is operated using a reel speed of 22 inches per minute. Using standard lane spacing design of 80% (which does not occur at this site) for general calculations, the following applies:

$$\text{Inches applied} = \frac{19.26 \times \text{flow (gpm)}}{\text{Lane spacing (ft)} \times \text{travel speed (in/min)}}$$

$$\text{Inches applied} = \frac{19.26 \times 197}{248 \times 22} = 0.70 \text{ inches, which equates to } 19{,}000 \text{ gallons per acre.}$$

There is a direct correlation between travel speed and depth applied. Thus, if you wish to apply 0.35 inches, or 9,500 gallons per acre, you must operate the reel at 44 inches per minute. The only other parameter that could be changed is the flow which could be reduced by changing the nozzle. You must correlate your application amounts with what is permitted in your nutrient management plan.

FIELD SLAS 35-07

The preferred mode of operation for this field is to operate the gun in a stationary mode. Two design options are presented here for consideration. Each is shown on a field map with the gun placement and operating parameters. Switching to a 0.86 inch ring in the nozzle with increase wetted area and efficiency of irrigation. Once the field sets are verified such that septage is not applied in buffers or within the 5-foot field edge setback, these locations should be permanently marked and the gun set there each time. Both designs are based upon the 50-70% gun spacing guidance from NCSU Cooperative Extension Publications.

FIELD SLAS 35-06

One irrigation pull will be used in this field. A 5-foot buffer must be maintained from the woods edge. The wetted length of the run is 875 feet. The reel specifications show a wetted diameter of 310 feet. Using the reduction factor for a single pull of 78% (0.78) as specified in NCSU publication AG-553-07, the effective wetted diameter becomes 242 feet and the effective wetted area is 242 feet x 875 feet = 4.8 acres. The remainder of the field will be covered with the pumper truck. Note that the reduced outside areas of the irrigation pattern may also receive some application from the pumper truck to make a more uniform across-the-field application. If the 0.86 inch ring is used in this field, the diameter and flow are reduced as per above.

GENERAL OPERATING PARAMETERS

A maximum of 0.7 inches (19,000 gallons per acre) should be applied per application event. For the traveling gun in a traveling mode, this equates to:

22 inches per minute with the present settings (nozzle and pressure)
16 inches per minute with 0.86 inch ring at 70 psi

For stationary operation in Field SLAS 35-07:

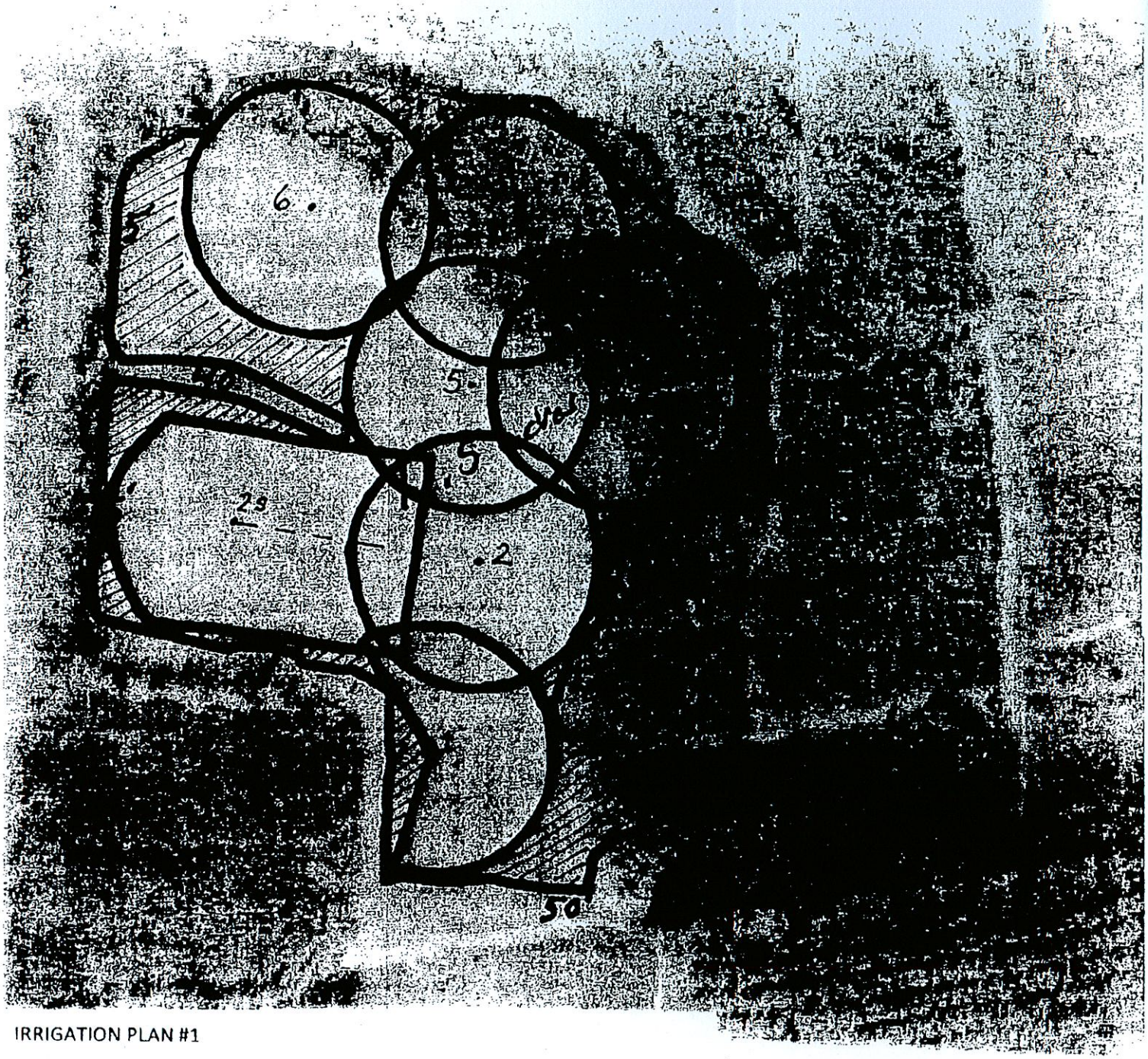
156 minutes irrigation run time with the present settings (nozzle and pressure)
208 minutes irrigation run time with 0.86 inch ring at 70 psi

Irrigation run times should be reduced, and/or travel speeds increased, when conditions do not warrant a full application. Such conditions include already damp soil, incoming rainfall, wind, etc.

IRRIGATION CALIBRATION

Calibration should occur at least once per year with the revised SB1217 irrigation calibration guidance document. Simply, this document substantiates that wetted diameter and uniformity are adequate as a function of nozzle size and system pressure. Thus, at least one time per year, perform the following:

1) Pressure reading at the gun after system is up to full operating pressure (5 or more minutes after pump on).
2) Inspect nozzle for wear and pitting. Insure that the nozzle chosen for design (0.86 inches) is in place by removing for inspection or verifying orifice size with caliper.
3) Check reel travel speed for mobile pulls to insure that it is at design speed to achieve target application rate.



IRRIGATION PLAN #1

Solid Set with one 290-foot mobile run. Design specifications:

1) 1.08 inch ring at 70 psi: 197 gpm at 300 foot wetted diameter.
2) Design spacing to meet wettable acres standards: 50 – 70%.
3) Actual design spacing used: 60 -90%. Average design spacing: 71%
4) Gun angles 360 degrees except: #1: 250°

LICENSED SOIL SCIENTIST
KARL A. SHAFFER
1009
STATE OF NORTH CAROLINA

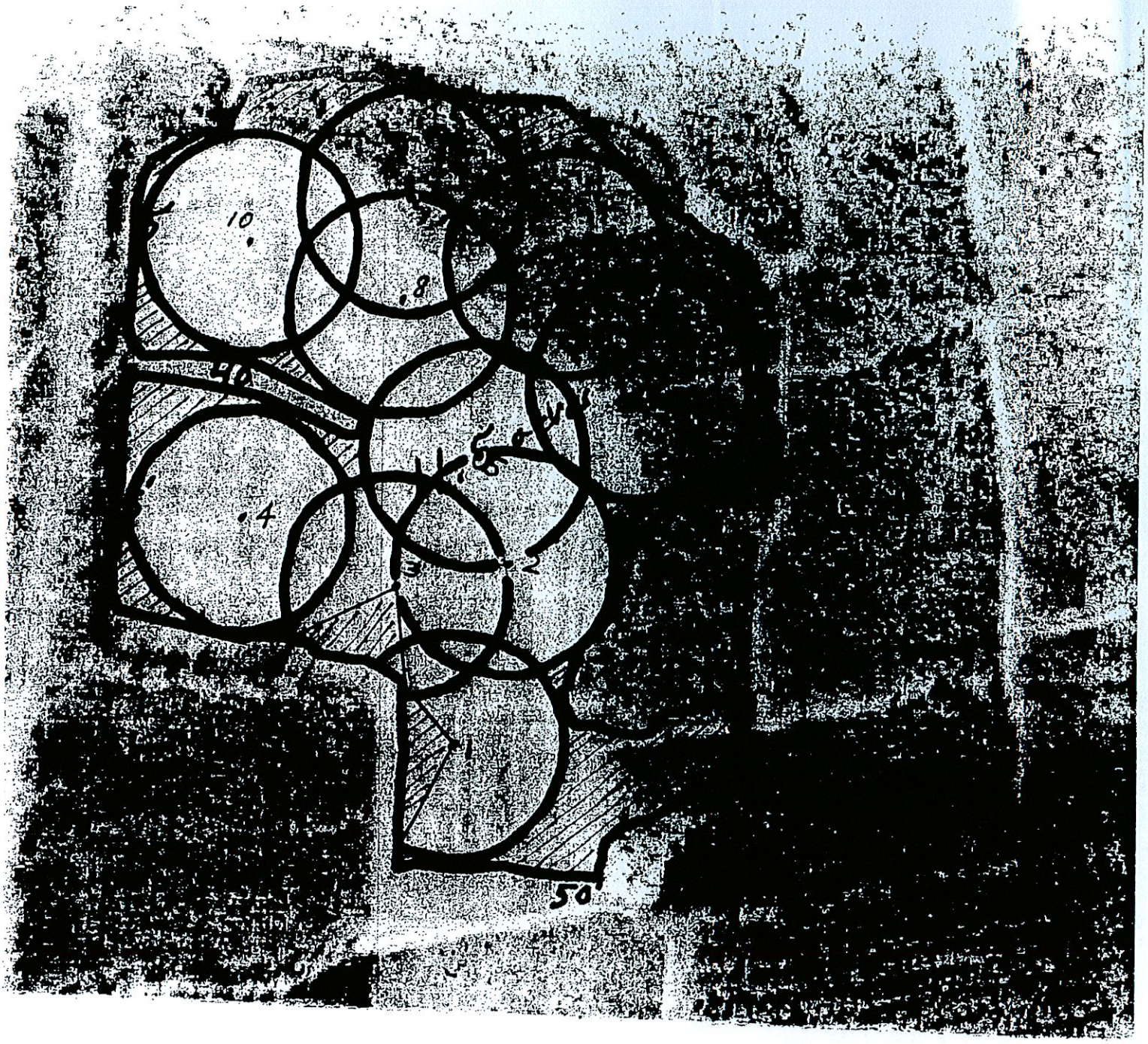
Legend:

1 = Gun location by number

25 = Stop location for gun on mobile pull- 290 linear feet

//// = Unwettable acres- to be left open or covered by truck

SCALE: 1 inch = 165 feet



IRRIGATION PLAN #2

Solid Set System setup. Design specifications:

1) 0.86 inch ring at 70 psi: 120 gpm at 270 foot wetted diameter.
2) Design spacing to meet wettable acres standards: 50 – 70%.
3) Actual design spacing used: 50 -70%. Average design spacing: 62%
4) Gun angles 360 degrees except: #1: 250°, #3: 280°,

LICENSED SOIL SCIENTIST
KARL A. SHAFFER
1089
STATE OF NORTH CAROLINA

Legend:

| = Gun location by number

//// = Unwettable acres- to be left open or covered by truck

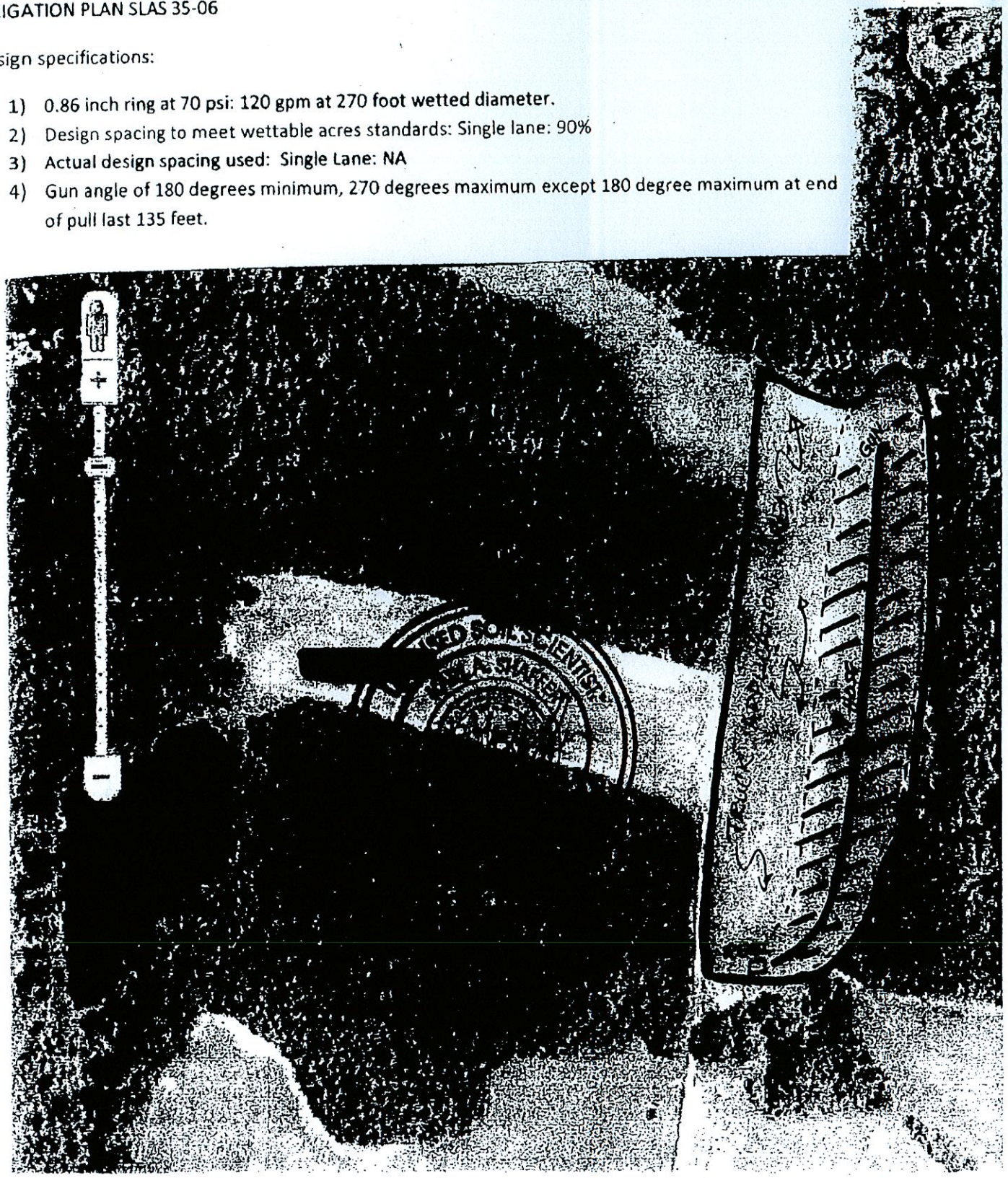
SCALE: 1 inch = 165 feet

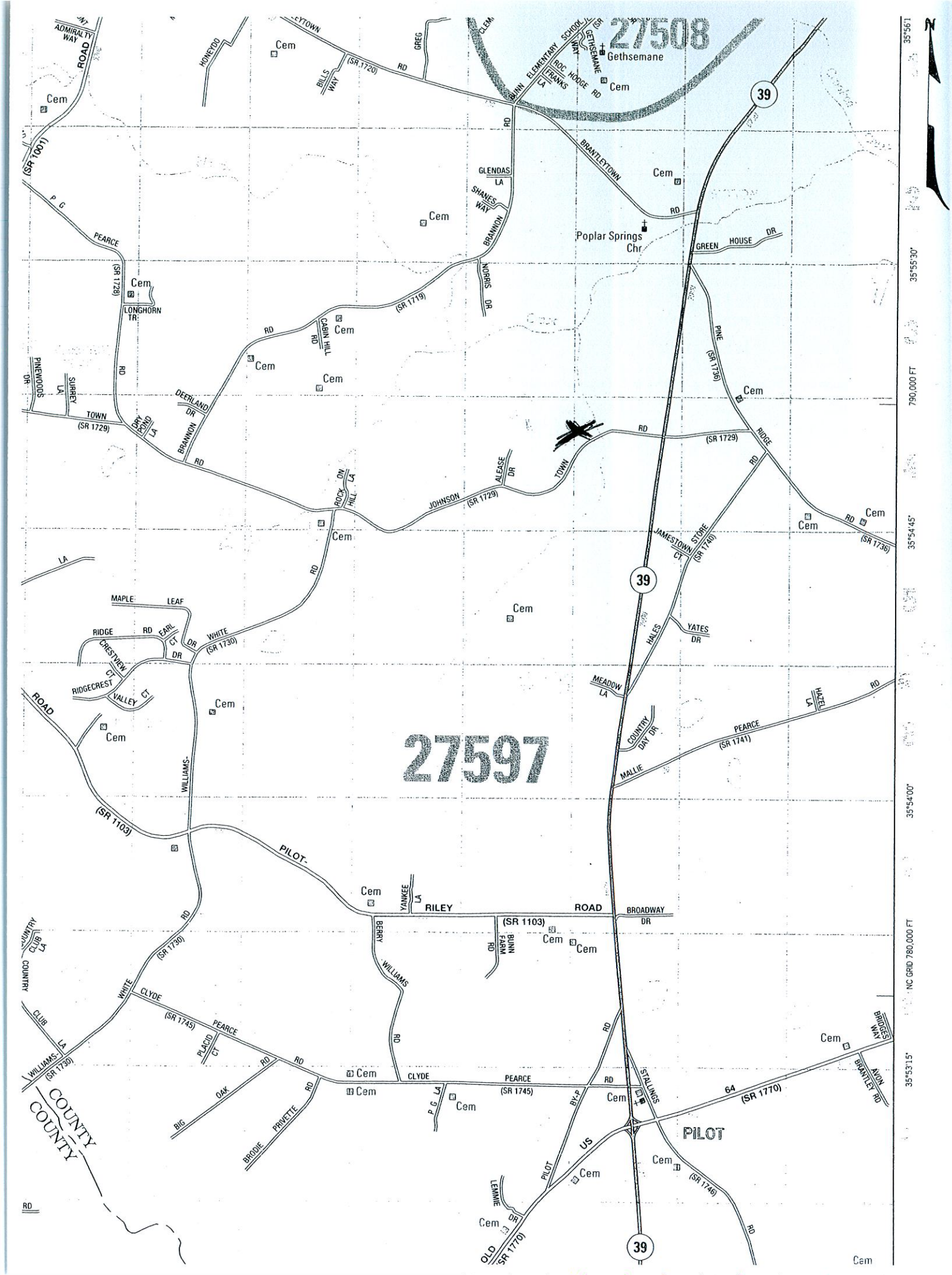
Pri

IRRIGATION PLAN SLAS 35-06

Design specifications:

1) 0.86 inch ring at 70 psi: 120 gpm at 270 foot wetted diameter.
2) Design spacing to meet wettable acres standards: Single lane: 90%
3) Actual design spacing used: Single Lane: NA
4) Gun angle of 180 degrees minimum, 270 degrees maximum except 180 degree maximum at end of pull last 135 feet.

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39
BRANTLEYTOWN
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SHANES WAY
BRANNON
NORRIS DR
GREEN
HOUSE
DR
P G
PEARCE
(SR 1728)
LONGHORN TR
(SR 1719)
CABIN HILL
RD
PINE
(SR 1736)
RIDGE
PINEWOODS DR
SURREY
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TOWN
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DRY POND
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DEERLAND
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(SR 1729)
JAMESTOWN
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STORE
(SR 1740)
MAPLE
LEAF
RIDGE
EARL
CT
DR
WHITE
(SR 1730)
CREST VIEW
RIDGECREST
VALLEY
HALES
YATES
DR
MEADOW
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HAZEL
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COUNTRY
DAY DR
PEARCE
(SR 1741)
MALLIE
WILLIAMS
(SR 1103)
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ROAD
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BROADWAY
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BERRY
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FARM
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WILLIAMS
COUNTRY
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64
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COUNTY
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35°55'30"
790,000 FT
35°54'45"
35°54'00"
NC GRID 780,000 FT
35°53'15"


E2216000
E2218000
N792000
N790000
N788000
6.25 acres
5'
5'
30'
30' ROW

NC 39 HWY S
JOHNSON TOWN RD
ALEASE DR
1 in. = 3230 feet